

Vehicle Theft Alert And Engine Lock System Using Arduino

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Abstract- This paper suggests a method to make the theft of vehicle highly impossible. To achieve that GSM and Arduino technologies are used. When the device senses the start of the vehicle by any person except owner of the vehicle, it sends an SMS to the owner. There is also an alarm in the device to alert the nearby people or security personnel. The system works in such a way that when a person attempts to steal the vehicle, the microcontroller in it is interrupted and the command is sent to the GSM modem to send an SMS. On the receipt of the message, the owner sends back the SMS to the GSM modem. After receiving the SMS from the owner the microcontroller uses a special mechanism to stop the engine ignition. The started vehicle can also be turned off by the owner using a mobile application. Thus it provides both SMS alert and engine locking system. Once the engine is locked due to unauthorized access it can be unlocked using Android Application which is interfaced with GSM.

Keywords- GSM, Arduino, Android Application, Vehicle.

I. INTRODUCTION

In our day-to-day life, vehicles play an important role. Unfortunately, we are also facing the high possibility of vehicle theft. The National Insurance Crime Bureau reported that nearly 765,484 vehicles were stolen in 2017 (nation-wide). The vehicle theft rate held steady at about 236.9 stolen per 100,000 people in 2017 which tells us that almost every common man owns a vehicle. Vehicle theft is a common concern which is faced by each and every one in uncertain parking places. Though it looks like a most important problem, only little is being done about it. There are various causal problems like carelessness of the vehicle owner by parking in insecure places.

To avoid facing these kind of problems, the security has to be increased. Whenever the vehicle is started, the owner must be ready to stop the theft wherever he/she is. GSM technology is used to achieve this. GSM stands for Global System of Mobile Communication which uses a SIM (Subscriber

Identity Module) card to send and receive SMS. When it seen from the mobile operator views GSM looks exactly like a mobile phone. The sending and receiving of the messages are controlled by micro controller. Arduino is used as a microcontroller.

II. SURVEY OF RELATED WORK

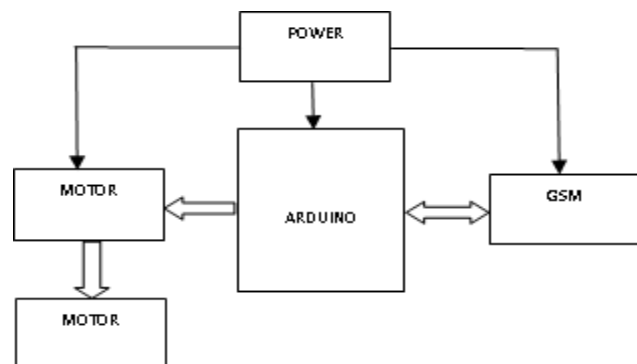
There are many security systems discussed and developed by researchers and engineers. But all those advanced systems are proposed only for cars and not for two wheelers. There are security systems like drivers face recognition using image processing and finger print sensor. They can be installed only in cars and also they tend to be more economic. There are also few out-dated security systems. For a well prepared thief those are mere obstacle. Even space is a problem in two wheelers. So, it is necessary to build a device that can fit into a two wheeler, which is less economic and easy to be operated.

III. PROPOSED SYSTEM

In our proposed method we are using components such as

1. Arduino Controller
2. GSM
3. Motor Driver
4. Motor (Engine)
- 5.

A. Block Diagram



The device operates on two modes namely

1. Active Mode
2. Protected/Locked Mode

In active mode the vehicle is fully operational under the owner control and there is no need for protection. If the owner wants to give protection to the vehicle he/she sets the device in protection mode.

Once the device is set into protection mode, it is designed such that when the controller detects the engine ignition the device intimates the owner about the action through an SMS.

The device can be switched between modes through a mobile application. During protection mode when the engine starts, the following process takes place

1. Arduino detects the ignition of the engine.
2. GSM receives a signal from the Arduino.
3. GSM intimates the owner through an SMS.
4. Owner receives the intimation and locks the engine with the help of a mobile application or an SMS.
5. Thus the engine is locked and the ignition is stopped. The device can be set to active mode again with the help of the mobile application.

B. Arduino Microcontroller Uno:

The microcontroller used in this system is Arduino. These are the following features

1. 14 digital input and output pins, 6 can be used as PWM
2. 6 analog inputs
3. USB connection
4. 16MHz crystal oscillator
5. Power jack
6. Reset Button

It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started. The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and

the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

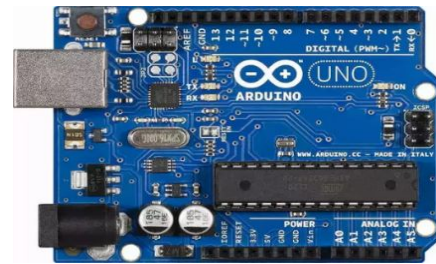


Fig.2: Arduino Controller

C. GSM Modem SIM900:

SIM900 is a complete Quad-band GSM/GPRS solution in a SMT module which can be embedded in the customer applications. Featuring an industry-standard interface, the SIM900 delivers GSM/GPRS 850/900/1800/1900MHz performance for voice, SMS, Data, and Fax in a small form factor and with low power consumption

With a tiny configuration of 24mmx24mmx3mm, SIM900 can fit almost all the space requirements in your M2M application, especially for slim and compact demand of design.

Features of GSM:

1. Single supply voltage
2. Typical power consumption
3. Tri-band
4. MT, MO, CB, text and PDU mode
5. SMS storage: SIM card
6. Supported SIM card: 1.8V, 3



Fig.3: GSM Modem

D. Arduino Software:

The Arduino project provides the Arduino integrated development environment (IDE), which is a cross-platform application written in the programming language Java. It originated from the IDE for the languages *Processing* and *Wiring*. It includes a code editor with features such as text cutting and pasting, searching and replacing text, automatic

Simulation Software indenting, brace matching, and syntax highlighting, and provides simple *one-click* mechanisms to compile and upload programs to an Arduino board. It also contains a message area, a text console, a toolbar with buttons for common functions and a hierarchy of operation menus.



Fig 4 Arduino IDE

IV. CONCLUSION

In this paper, we proposed a method to detect the theft of vehicle and to lock the engine when it is started with unauthorized person. The device is in active mode until the owner handles the vehicle and it can be switched to protection mode using a mobile application. During this mode when the vehicle is started the owner is intimated with an SMS and the engine is locked. Later for the future, a GPS module can be installed so that it would be easy to track the vehicle when it is handled by children and most importantly fuel theft detection can be included so that the fuel level can be monitored and can prevent it from being stolen.

V. FUTURE SCOPE

When thinking about the update of this system, as like cars have tracking systems this system can also be updated with one. The tracking can be done using GPS technology lengthened as Global Positioning System which provides the latitude and

longitude details. This information can be sent as SMS to the owner along with the alert SMS. To find the location of the vehicle, the owner has to enter the latitude and longitude values in Google Map. This can be helpful to the parents who want to monitor their child driving their vehicle. Additionally, a fuel theft detection system can also be included in order to reduce the theft of fuel from a parked vehicle. These can be installed into any two wheelers.

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